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Review On The Market - Potential For Par
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*Alberta Dept of Industry
and Commerce.*

A REVIEW ON THE MARKET
POTENTIAL FOR PARTICLE
BOARD IN WESTERN CANADA

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A REVIEW ON THE MARKET
POTENTIAL FOR PARTICLE
BOARD IN WESTERN CANADA

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The major objective of this report is to provide some initial insight into the market potential for a particle board product which could utilize poplar mill residues from the lumber industry in Northern Alberta. This report will be used to determine the feasibility of carrying out a much more exhaustive study similar to the "flakeboard" study which may provide information for preparation of a submission to the Department of Regional Economic Expansion for Federal funding.

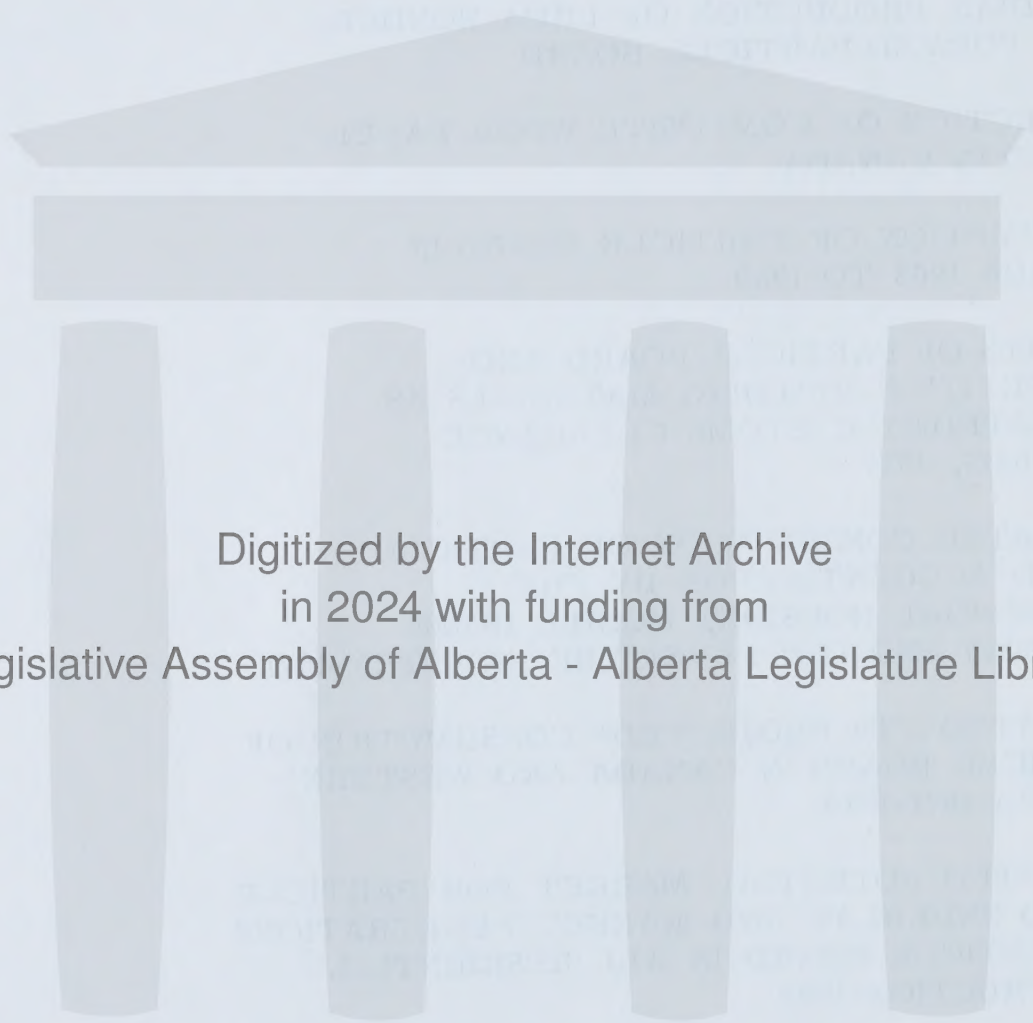
Sources of information for this report are the Alberta Bureau of Statistics, Statistics Canada, reports prepared by the Forest Economics Research Institute, Federal Department of Fisheries and Forestry, reports prepared by the Alberta Department of Industry and Commerce and a number of interviews with end users and suppliers.

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I. INTRODUCTION

The lumber milling industry in Northern Alberta is having difficulty disposing of poplar wood waste. Pollution free burning of poplar waste is expensive. Its low resin content gives it a poor burning characteristic. Some of the cull round log from the industry will be utilized in the production of wafer board if a proposed plant is established in Slave Lake. The remaining waste, primarily small pieces and saw dust, may be disposed of either by burning or through the production of a similar type of composite board, particle board. Production of particle board requires heat and pressure to bind wood particles together with a formaldehyde base resin. Particle board is not water proof and must be used for interior work. Much of the equipment required to process wood waste for pollution free burning can be used in the preparatory stage of a particle board plant.

This Department has been requested to provide assistance in examining the market potential for particle board in Western Canada. Two samples of a product which could be manufactured were provided. Both samples are ureaformaldehyde bonded particle board. One sample is a single layer, homogenous, medium density board. The other sample has a similar core density with more dense, harder surfaced layers on the outside. One of the objectives of this study is to solicit the opinion of end users with regard to the relative merits of these two samples. The following are some of the other questions which it is hoped the study will be able to provide answers for.

- What quantities of particle board and similar competitive products are coming into Western Canada?
- Who are major end users of particle board?
- Do end users have a need for particular characteristics that would make a new product more attractive to them than what

they are using now?

- Is there a premium market for cut-to-size and overlaid boards and what are the characteristics of that demand?
- Can major end users be segregated according to product, e.g. floor underlay as compared to the furniture industry?
- The industry is interested in as much information as possible about such things as price of imports, prices end users would be willing to pay, quantity requirements, production cycles, and potential distribution channels, etc.

Initially the industry is interested in the Western Canadian market only. It should be kept in mind during the study that no output could be expected from a new particle board plant for at least two years.

II. SUMMARY AND RECOMMENDATIONS

The current demand for particle board all across Canada appears to be increasing. Consumption has nearly doubled in the past five years going from 123.5 million square feet 5/8" basis in 1966 to 239.9 million square feet in 1971. The Wood Products Branch, Federal Department of Industry, Trade and Commerce has projected a growth rate of between 10% and 15% for the industry to 1980. Particle board production in Canada has been increasing as well. Production nearly doubled between 1966 and 1971 going from 110 million square feet in 1966 to 204 million square feet in 1971. Production is projected to more than double again by 1975. Exports in 1971 were estimated at 10 million square feet. Exports particularly to the United Kingdom are expected to rise considerably in 1972. The imports required to meet the demand for particle board in Canada come primarily from the U.S. The 1971 volume of imports at 48 million square feet is expected to nearly double in 1972 to around 90 million square feet, 5/8" basis. The Wood Products Branch estimates that American particle board is currently meeting 30% of the Canadian demand.

The particle board industry is capital intensive and very sensitive to economies of scale. The large presence of American imports on the Canadian market is a result of over capacity and low selling price from American mills.

An example of the scale of plant being established in the United States is the particle board mill which recently went into production in Roseburg, Oregon. This one plant with a capacity of 800 tons per day can produce almost as much particle board as the combined production of all the plants in Canada.

Available statistics do not provide a clear picture of the production and consumption of particle board in Western Canada. In order to gain some

insight into this market it was necessary to extract from the statistics available on particular industries the quantities of particle board consumed by major end users. Based on the consumption pattern established in this manner it was possible to estimate the quantity of particle board consumed in the Western provinces.

Apparent total consumption of particle board in Canada in 1971 was 239.9 million square feet 5/8" basis. It is estimated that consumption in the provinces of Manitoba, Saskatchewan and Alberta accounted for 20% of the total or 47.7 million square feet. Probably 2/3 of this amount or about 32 million square feet were consumed in Alberta. British Columbia consumed about 11% or 26.4 million square feet. The estimated consumption figure for all of Western Canada, about 31% of total Canadian consumption, was 74.3 million square feet. Assuming a 10% growth rate projected 1975 consumption in Western Canada will be 108.8 million square feet 5/8" basis.

Verifiable information about the production of particle board in Western Canada is not available. According to information from persons in the industry 1971 production at three plants in Western Canada was about 80 million square feet. Two of these plants are located in British Columbia. The MacMillan-Bloedel, K₃ particle board division is located in Vancouver and the Parta Industries plant is located at Grand Forks. The combined production from these two plants was 60 million square feet. The third plant located at Sprague, Manitoba had an estimated 1971 production of 20 million square feet. Of this 80 million square feet, it is estimated that over 30 million square feet was marketed outside of Western Canada through national distributors. It could not be determined whether any particle board in Western

Canada was exported out of the country.

Almost 25.6 million square feet or 50% of the estimated 48 million square feet of particle board imported into Canada in 1971 came through Western Canadian customs points. The largest share of imports 19.6 million square feet came into British Columbia, 4.3 million square feet were imported into Alberta and a total 2 million square feet were imported into Saskatchewan and Manitoba.

Current consumption, production, export and import figures for particle board in Western Canada show production to be almost matched up with consumption. Imports from the United States fill the gap in supply caused by the export of particle board to markets outside Western Canada. From the information available, this initial review would indicate that the establishment of a particle board plant in Alberta catering to the Western Canadian market and scheduled to go into production in late 1975 warrants some serious consideration.

Current imports of 25.6 million square feet plus projected increase in demand of 22.3 by 1975 would indicate a sufficient market for additional plant capacity of about 50 million square feet 5/8 " basis.

It is clear that such a plant would have to be able to compete with very stiff competition from plants operating in the North Western United States. U.S. producers are currently depressing optimum Canadian prices by 5% despite a 15% tariff on imports.

Initial indications are that the market requires a fairly standard product. The standard board is a medium density 41#-45# graduated board with a smooth surface sold in 4' x 8' sheets. Smaller quantities of a 54# board are used in desk and table top manufacture. The desk industry is the major user

of cut to size sheets. Oversize and undersize boards are required for underlayment. Extra long boards are required in the mobile home industry and for making counter tops. It may be possible to produce the small number of variations in size and density in one plant.

The mechanics of the distribution of particle board appears to be similar to the distribution of plywood and flakeboard. The details worked out in the "Flakeboard" study are likely to apply to the distribution of particle board. Since few end users seem to be tied to a particular distributor or manufacturer the guiding criterion appears to be price.

The exact prices being paid for particle board are difficult to obtain. A poll of the major distributors in Edmonton shows that the distributor cost price for a standard 41 to 45 pound density number one quality particle board was steady during the third quarter of 1972 at between \$98.00 and \$100.00 per thousand square feet 5/8" basis.

Distributors cost price represents the list price taking into account none of the market discounts but including a 15% import tariff, 11% Federal Sales Tax and freight charges to Edmonton. The current price is about 10% higher than the price during the same period in 1971. The price of domestically produced particle board was about the same as the price for imported board.

The Federal response to any suggestion to establish a particle board plant in Alberta in the past has not been encouraging. Problems which have been pointed out, include lack of local markets, long distances to markets, lack of primary wood industry to supply a cheap supply of wood residue, unsuitable climate and no existing marketing organization to handle a new product coming out of Northern Alberta.

The current Federal Department of Industry, Trade and Commerce opinion is still a very cautious one. The Department is interested in keeping up to date on the market situation for particle board in Western Canada. Apparently a number of manufacturers are interested in producing for that market. If a market for particle board can be defined in Western Canada the critical factors will definitely be the cost of production and the delivery cost of the product to the end user.

Current Federal opinion would indicate that the minimum capacity for any new mill being established in Canada should be around 300 tons/day. The output from a mill of this size, 80-100 million square feet, would have to compete in the total Canadian market.

One factor which may favour the establishment of a particle board mill from the Ottawa point of view is the increasing pressure being applied to the wood products industry by the anti-pollution people. Use of mill residue in the manufacture of particle board would eliminate the disposal problem.

The wisdom of establishing a small mill seems questionable in light of difficulties which have been encountered by the Parta Industries Mill in British Columbia and the Columbia Forest Products Mill in Manitoba. Both of these mills apparently were unable to meet competition from American imports. It is only the recent dramatic increase in demand caused by record high plywood prices which has allowed these mills to enter the market place. Both of these mills should be visited if a small scale mill is being contemplated.

Probably the largest markets for particle board are found in the residential housing industry. Major end users within the industry are for kitchen cabinets, interior millwork, counter tops and trim, and as floor underlay.

A full discussion of end users of particle board can be found further on in this report. Of the two samples of particle board being considered for production the three layered sample appeared to be the most popular for kitchen cabinets and floor underlay however indications were that the industry would not be willing to pay a premium for the denser surfaced board. The rest of the market did not express a preference for either of the samples provided.

It would appear that price will be the critical fact in the establishment of a particle board industry in Alberta. Output from a medium sized plant, 50-60 million square feet per year, could be absorbed into the Western Canadian market. Initial indications are that a fairly standard product makes up most of this demand. A more exhaustive analysis of the market is not likely to be necessary unless production studies indicate the ability of the industry to compete with imported American made board.

An alternative avenue to greater market penetration other than through competitive pricing may be through product specialization. Initial indications are that there doesn't appear to be a great deal of product differentiation in type and quality of board. Size and thickness appear to be the areas in which a certain amount of product specialization can take place. In order to determine the parameters of this potential a physical survey of the market to determine product specifications required by major end users across Canada is necessary. Some potential market areas which deserve further consideration in this regard are the floor underlay industry which potentially could make use of large amounts of 3/8" board and the counter top and desk manufacturing industry which uses cut-to-size and off size boards. The 1971 production and consumption estimates follow in Table 1.

TABLE 1

ESTIMATED CONSUMPTION IMPORTS AND PRODUCTION
OF PARTICLE BOARD - 1971

	<u>Consumption</u>	<u>Imports</u>	<u>Production</u>
	(Quantities in million square feet: 5/8" basis)		
British Columbia	26.4	19.3	55*
Alberta	32.0	4.3	nil
Manitoba and Saskatchewan	15.9	2.0	25
Western Canada	74.3	25.6	80
Canada	239.9	48.0	204

* Estimated 1971 production of the Parta Industries plant in Grand Forks, British Columbia is 20 million square feet.

Source: Figures for Canada based on - Wood Products Branch, Federal Department of Industry, Trade and Commerce estimates.

Provincial breakdown of figures - Planning and Intelligence Branch, Alberta Department of Industry and Commerce.

III. CANADIAN SITUATION

- a. Canadian Supply of Particle Board
- b. Canadian Demand for Particle Board

a. SUPPLY OF PARTICLE BOARD IN CANADA

The particle board industry in Canada is presently going through a period of very rapid expansion. The productive capacity of Canadian mills more than doubled between 1968 and 1971 as Table 2 shows. It is expected to almost double again before 1975.

The increase in production forecasted by the Federal Department of Industry, Trade and Commerce is expected to ~~come from the~~ expansion of existing plants and construction of at least two additional plants each with an annual capacity of 60 million square feet.

Average plant capacity in 1970 was about 23 million feet. Average new plant capacity as the industry expands will be closer to 50 million board feet. Production of particle board is distributed all across Canada. Three plants are located west of the Ontario border, one plant is located in each of Ontario and Quebec and three more plants are located in New Brunswick. Production nearly equaled consumption in Western Canada in 1971 although about 25 million feet of particle board produced in Western Canada made its way into markets in central Canada. About 10 million feet were exported from Eastern Canada in 1971. Most of the remainder made its way into markets in Central Canada. Exports are likely to be up from Eastern Canada in 1972 according to the Wood Products Branch, Federal Department of Industry, Trade and Commerce.

Canadian production has to meet strong competition in international markets, and in the domestic Canadian market from American producers of particle board. The rate of growth of the particle board industry in the U.S. about 20% to 25% annually has been similar to growth in the Canadian industry over the last 10 years. The average plant capacity in the U.S. however, at about 60

TABLE 2

CANADIAN PRODUCTION OF UREA BONDED, MAT
FORMED PARTICLE BOARD

<u>Year</u>	<u>Production in M. M. Square feet, 5/8" basis</u>	<u>Plant Capacity in M. M. Square feet, 5/8" basis</u>
1966	110	160
1968	134	184
1969	181	271
1970	188	271
1971	204	420
1975 projected	493	700

Source: Wood Products Branch and PLYWOOD AND BOARD
PRODUCTS DIRECTORY

million feet, is nearly double the Canadian average capacity. The productive capacity of plants located in the North Western States is a serious threat to domestic production in Western Canada.

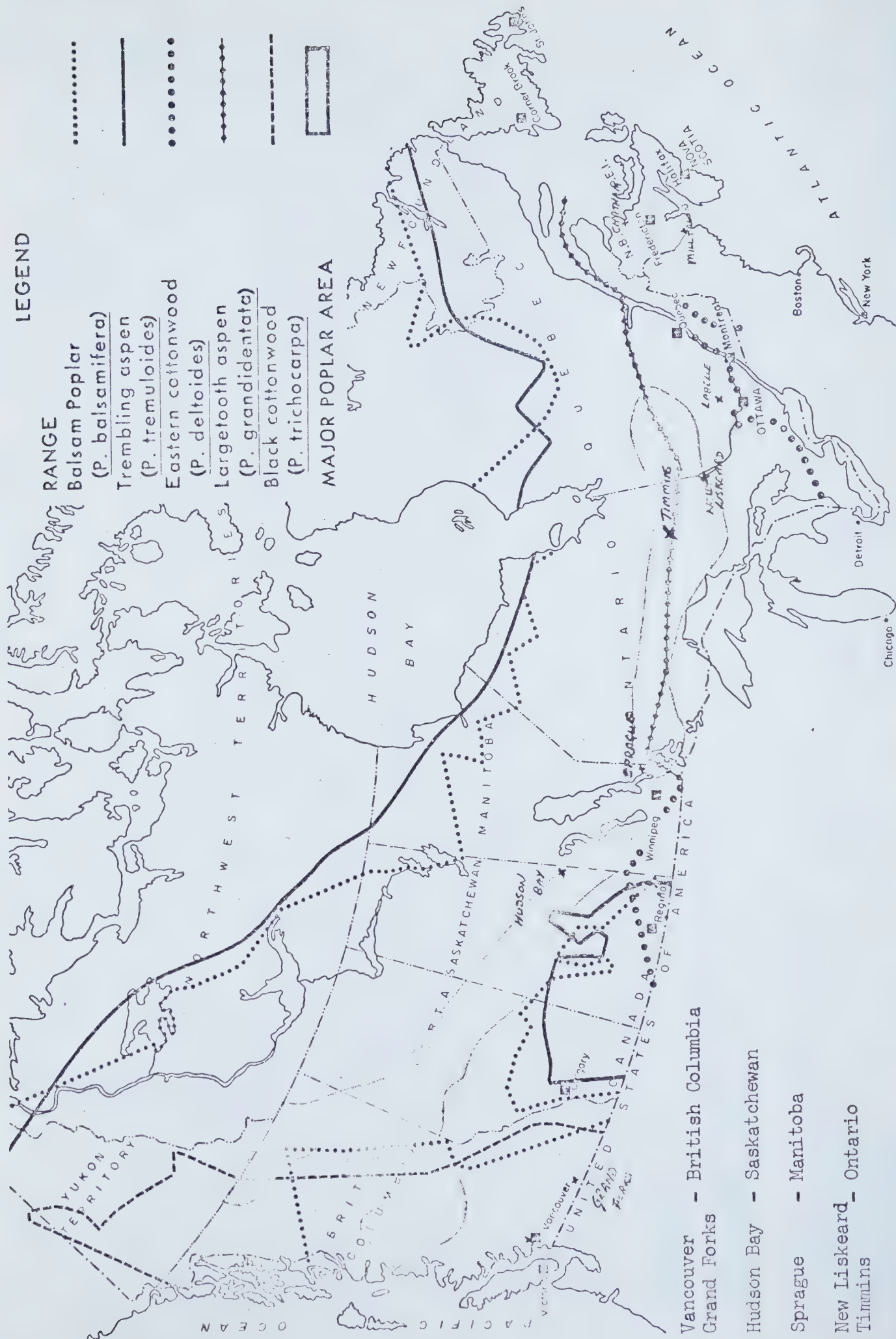
Table 3 provides some information about plants producing particle board and related wood panel products in Canada. The maps on the following pages show these plants and competitive plants in the United States. U.S. particle board capacity will almost double between 1969 and 1973 from 2.0 billion feet to 3.8 billion feet 5/8" basis. The U.S. market is expected to absorb this capacity in the long run, however short term fluctuation in the American economy may result in excess capacity from the U.S. mills being dumped on the Canadian market. Wood Products Branch estimates that imports from the U.S. are currently supplying 30% of the Canadian market. 1971 imports into Canada were in the order of 48 million square feet. This was up from 8 million feet in 1967.

TABLE 3

PRODUCTION OF COMPOSITE WOOD PANEL BOARD IN CANADA

Province	Plant Location And Trade Name	Type of Board	Raw Material	Capacity MM Sq. Ft.	Production MM Sq. Ft. 3/4"
				1967	1970
British Columbia	Vancouver - MacMillan-Bloedel K3 Particle Board	Single Layer Graduated Particle Board	red cedar mill residue	40	35
"	Grand Forks - Parta Industries parta board	Single Layer Graduated Particle Board	fir mill residue		35
Saskatchewan	Hudson Bay - MacMillan-Bloedel Aspenite	wafer board	aspen poplar	67	37
Manitoba	Sprague - Columbia Forest Products Bisin Board	One Layer Particle Board	aspen poplar	20	25
Ontario	New Liskeard - Rexwood Products Rexwood	Three Layer Particle Board	poplar round- wood and wood shavings	25	25
"	Timmins - Waferboard Co. (under construction, scheduled to start production Feb., 1973)	wafer board			
Quebec	Labelle - Sogefor Ltd. - Dupan 600	Three Layer Particle Board	poplar roundwood hardwood chips	40	13
New Brunswick	Milltown - Flakeboard Co. - Rezflake, Rezcore, Bisonal	One Layer Particle Board	roundwood and shavings	34	22
"	Chatham - Aircscrew-Weyroc - Price Mills Ltd	chipboard (interior) extruded particle board			
TOTAL				226	157

Source: Plywood and Board Products Directory.



Vancouver - British Columbia
Grand Forks

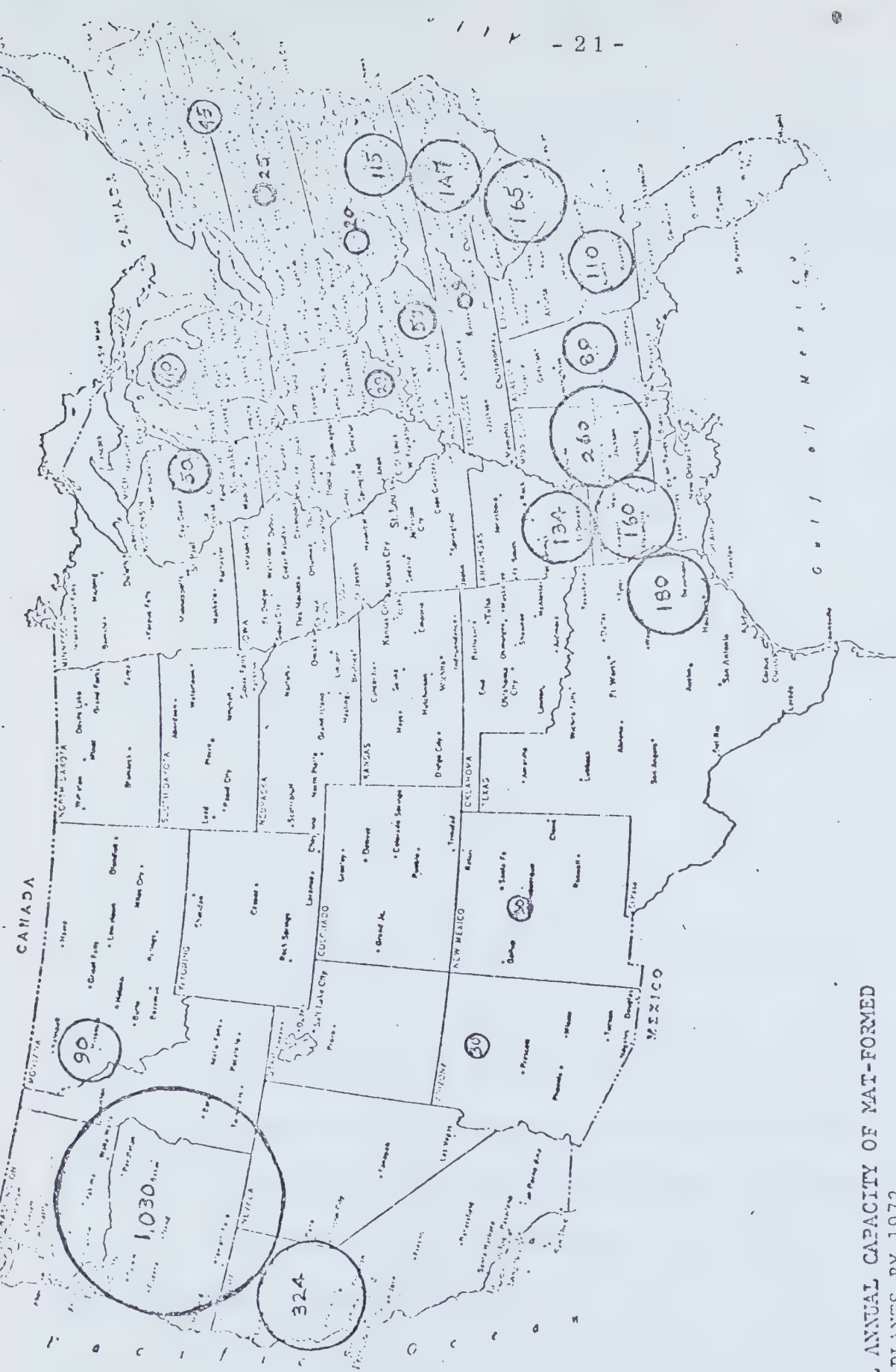
Hudson Bay - Saskatchewan

Sprague - Manitoba

New Liskeard - Ontario
Timmins

Labelle - Quebec

Milltown - New Brunswick
Chatham



APPENDIX B

ESTIMATED TOTAL ANNUAL CAPACITY OF MAT-FORMED PARTICLEBOARD PLANTS BY 1972

(Figures in circles are millions of square feet per annum 3/4" basis -- multiply by 1.2 to obtain 5/8")

TOTALS BY REGION	1969	1970	1972	1973
WESTERN REGION	854	1,059	1,334	1,600
SOUTHERN REGION	625	855	1,155	1,660
NORTHEAST & NORTH CENTRAL REGION	163	188	188	188
TOTAL - U.S.	1,642	2,102	2,677	3,448

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Source: Columbia Engineering International Ltd., Vancouver

b. DEMAND FOR PARTICLE BOARD IN CANADA

Canadian consumption of particle board has been growing at a rate of between 10% and 15% since 1963. Total consumption doubled between 1962 and 1970. Wood Products Branch estimates consumption will double again before 1975. Recent figures obtained from Wood Products Branch indicate apparent consumption for 1971 at 239.9 million square feet 5/8" basis. Per capita consumption was estimated at 11.1 square feet. The following table illustrates the growth in the industry from 1963 and estimates consumption for the industry to 1980.

Projections for 1970, 1975, 1980 are based on a 10% growth rate in consumption using the 1969 base figure. The 1971 figure was reported separately by Wood Products Branch. This additional demand represents the output of three medium size plants. According to the consumption patterns derived further on in this report the Western Canadian market in 1971 accounted for about 31% of total Canadian consumption, or about 74.3 million feet. If the consumption of particle board in Canada increases as projected by the Wood Products Branch, Department of Industry, Trade and Commerce, the 1975 demand in Western Canada will have increased by 22.3 million feet to a total of 108.3 million square feet. Assuming a similar proportion of the output from existing plants will be exported out of Western Canada the excess demand will be in the order of 50 to 60 million square feet. This demand will be met either by imports or by increased plant capacity.

TABLE 4

CONSUMPTION OF PARTICLE BOARD IN CANADA 1963 TO 1980

<u>Year</u>	<u>Population</u>	<u>Per Capita Consumption Square feet 5/8" basis</u>	<u>Total Consumption MILLION Square feet 5/8" basis</u>
1963	18,931	3.1	58.7
1965	19,644	5.1	100.4
1970	21,500	10.5	225.7
1971	21,711	11.1	239.9
1975	23,764	16.8	399.2
1980	26,027	27.1	705.3

Source: Based on Wood Products Branch figures reported in "A Report in the Current Supply and Demand for Particle Board in Canada, February 1970", a revised report from Wood Products Branch will be available by December 1972.

IV. WESTERN CANADIAN SITUATION

- a. Estimated Supply of Particle Board in Western Canada
- b. Estimated Demand for Particle Board in Western Canada

a. ESTIMATED SUPPLY OF PARTICLE BOARD IN WESTERN CANADA

There are presently three plants producing particle board west of the Ontario-Manitoba border.

The largest of the three, MacMillan-Bloedel K₃ particle board plant, is located in Vancouver. A smaller plant, Parta Industries, producers of parta board is located in Grand Forks, British Columbia. There are no plants producing ureaformaldehyde bonded particle board in either Alberta or Saskatchewan. The third plant is located in Sprague, Manitoba. Estimated total production from these three plants in 1971 was about 80 million square feet 5/8" basis.

Despite a 15% protective tariff, plants in Western Canada are facing strong competition from large scale plants in the North Western United States. Estimated 1971 production in the North Western States was well over 1,000 million square feet. One plant in Roseburg, Oregon has an annual capacity of around 800 tons/day which is almost as much as the total Canadian capacity. Pressure from anti-pollution legislation, government subsidies, and greater efficiency of production due to economies of scale have resulted in over capacity in the U.S. particle board industry. Even with the tariff at least one manufacturer in Western Canada has had to sell his output at 5% below the optimum price to maintain a share of the market.

The opinion of some of the major wood products distributors was solicited regarding the market situation for particle board. The distributors are generally happy with the present supply position. Any quantity of particle board is available from the U.S. In most cases U.S. made board can be imported at a lower price than Canadian made particle board. At present

the particle board industry is protected by a 15% tariff on imports. The standard type of board imported into Western Canada is a 4' x 8', low density, 40-45 pound board, with a smooth but not super smooth surface. This board can be imported tax, handling charges, etc. F.O.B. to Edmonton for \$95-\$100.00 per thousand 5/8" basis. Some specialty boards with up to 64 pound density for use in the desk manufacture industry and over size, under size and long boards for use as underlayment or counter tops are being imported as well. Very little plastic or vinyl covered board is being imported. Three plants, one in Vancouver, one in Winnipeg and one in Calgary manufacture overlaid and cut-to-size particle board for the cabinet and furniture industry. The name of the company in Calgary is International Vinyls Ltd.

Included in the appendix are the specifications for a typical imported board which happens to be one of the most versatile boards on the market. This particular board, duraflake, is used in furniture and cabinet manufacture, counter top manufacture, floor underlay and desk manufacture. It is available with a prime coat finish, undersize, oversize double length sheets and cut-to-size on special order.

Canadian imports of particle board increased four fold between 1968 and 1971. The increase has not been quite so pronounced in Western Canada where the increase has only been three fold. With imports of 24.5 million square feet Western Canada accounts for over one-half of total Canadian imports. Over two thirds of the 6.2 million square feet of particle board imported into the Prairies came through Alberta customs points. British Columbia imported 19.3 million square feet in 1971.

It is estimated that 10% of the miscellaneous building board imported into Canada is of particle board core. Import figures for 1971 are given in Table 5.

The dramatic increases in 1971 imports over 1970 imports illustrate two factors. The most important factor is the changing attitude of cabinet makers toward the use of particle board. The other main factor was the rising cost of plywood toward the end of 1971. The rising cost of plywood will be more evident in the 1972 import statistics.

One major distributor has estimated total imports to Canada in the first seven months of 1972 to be 52.3 million square feet 5/8" basis. The high cost of plywood may be attributed to the current building boom across Canada. Indications are that this boom is nearly over and that plywood prices will drop early in 1973 as the emphasis shifts from construction of high-rise apartment construction to construction of single family units.

TABLE 5

IMPORTS OF PARTICLE BOARD AND COMPETITIVE BUILDING MATERIALS
AS INDICATED BY CUSTOMS CLEARANCE RECORDS, 1971

CLASS - A - PARTICLE BOARD

<u>Year</u>	<u>Canada</u>	<u>Manitoba and Saskatchewan</u>	<u>Alberta</u>	<u>British Columbia</u>
(Thousand Square Feet 5/8" Basis)				
1967	8,032	64	1,248	2,464
1968	12,288	608	1,376	5,952
1969	25,967	687	849	4,898
1970	21,805	1,153	1,694	7,897
1971	48,754	1,976	4,274	18,334

CLASS - B - Miscellaneous types of building board including:

- ***plastic and vinyl covered particle board
- tectum board
- cellularwood
- metal coated plywood
- plastic and metal faced plywood

1967	17,476	111	747	12,659
1968	26,803	0	4	20,083
1969	17,447	214	1,655	7,697
1970	15,228	196	47	7,322
1971	27,734	197	777	10,031

Source: Statistics Canada and WOOD PRODUCTS BRANCH ESTIMATES

* imports are estimated to average 1/2". Figures have been converted to 5/8" basis.

** where values only were available, square footage was calculated using an average value per 4' x 8' sheet of \$3.50 for Class A and \$6.00 for Class B materials.

***It is estimated that 10% of the miscellaneous board is being imported.

b. ESTIMATED CONSUMPTION OF PARTICLE BOARD IN WESTERN CANADA

Western Canadian production of particle board, estimated in 1971 to be about 80 million square feet, is not all being marketed in Western Canada. British Columbia with an estimated 1971 production of 55 million square feet imported nearly 20 million square feet of particle board. The prairie region imported 6.3 million feet to make a total for Western Canada of 25.6 million feet.

The estimated consumption of particle board in Western Canada in 1971 was 74.3 million feet. The export of about 30 million board feet out of Western Canada may be accounted for by seasonal fluctuation in demand. The largest producer in Western Canada is also a national distributor of wood products. It is likely that any surplus inventory accumulated during months in which demand is below normal would be shipped off to markets in Central Canada or the U.S.

Gross figures for quantities of particle board consumed in Canada are available from Statistics Canada. Current consumption estimates and projected consumption figures are provided by the Wood Products Branch, Federal Department of Industry, Trade and Commerce. No figures are available which show the consumption of particle board in each province.

In order to estimate these figures a consumption pattern was worked out based on the quantities of particle board used in the new residential housing industry, the mobile home industry and the furniture industry. The following Table #6, summarizes the particle board consumption in these industries.

TABLE 6

ESTIMATED CONSUMPTION OF PARTICLE BOARD
ACCOUNTED FOR BY THE RESIDENTIAL HOUSING,
MOBILE HOME INDUSTRY AND THE FURNITURE
INDUSTRY - 1971

	<u>Canada</u>	<u>Manitoba, Saskatchewan and Alberta</u>	<u>British Columbia</u>	<u>Western Canada</u>
New Residential Housing				
Floor Underlay	14,546	5,364	2,699	8,063
Millwork and Trim	47,831	8,686	7,048	15,734
Mobile Home Industry	11,740	5,733	485	6,218
Furniture Industry	44,471	4,226	3,213	7,439
Total Consumption Accounted for	118,588	24,009	13,445	37,454

Source: Planning and Intelligence Branch

The apparent total 1971 consumption of particle board in Canada was 239.9 million square feet 5/8" basis (source: Wood Products Branch).

Nearly one-half of that consumption is accounted for in these three industries. Of the consumption accounted for, 20% was consumed in the Prairie region and 11% was consumed in British Columbia. If this consumption pattern is assumed to be consistent for all particle board used in Canada, estimates for regional consumption of particle board can be made as Table 7 shows.

The use of particle board for floor underlay is almost totally limited to the residential construction industry. Floor underlay is not necessary in most institutional or public buildings. Concrete and steel construction lends itself to direct application of tile or carpet floor coverings. Included in the category of residential housing are single detached housing units, semi-detached or duplex housing, row housing, and apartment buildings of less than seven stories. Although mobile homes are not for statistics purposes considered residential housing, the mobile home industry is another major potential market for particle board underlayment. The potential market for underlay follows in Table 8.

Only 1/2 to 2/3 of the floor area in residential construction requires underlay. Particle board accounts for 17% of the underlay used across Canada, 30% of the underlay used in Manitoba, Saskatchewan and Alberta and 17% of the underlay used in B.C. Nearly 2/3 of the dwellings starts in the prairies in 1971 were in Alberta. The general trend is toward an increase in dwelling starts of about 2% per year. The number of new dwelling starts by province in Canada between 1961-1971 is listed in the appendix.

TABLE 7

ESTIMATED AND PROJECTED* CONSUMPTION OF PARTICLE BOARD
IN CANADA AND WESTERN CANADA 1971-1975

	<u>Canada</u>	<u>Manitoba, Saskatchewan and Alberta</u>	<u>British Columbia</u>	<u>Western Canada</u>
	(Quantities in Millions of Square Feet 5/8" Basis)			
1971	239.9	47.9	26.4	74.3
1975	351.2	70.2	38.6	108.8
1980	565.5	113.1	62.2	175.3

* Projections based on 10% growth rate forecasted by Wood Products Branch.

Based on Wood Products Branch estimates and consumption pattern determined
by Department of Planning and Intelligence.

TABLE 8

ESTIMATED POTENTIAL MARKET FOR PARTICLE BOARD
UNDERLAY AND MARKET PENETRATIONS OF PARTICLE
BOARD IN ALL NEW RESIDENTIAL CONSTRUCTION-1969

	<u>Canada</u>	<u>Prairies</u>	<u>British Columbia</u>
	(Thousand square feet)		
Total Floor area	125,613	23,539	20,360
Total area of underlay used	73,707	16,087	14,370
Area of particle board used as underlay	12,649	4,789	2,410
per cent of total floor area requiring underlayment	59%	68%	70%
per cent of total floor area using particle board underlay	10%	20%	12%
per cent of market penetration of particle board for floor underlay	17%	30%	17%

Source: Forest Economies Research Institute, Federal Department of Industry,
Trade and Commerce

An estimated 12.6 million square feet of particle board was consumed as floor underlay in new residential housing in 1969 across Canada in Table 9. The British Columbia market accounted for about 2.4 million square feet of particle board. The Manitoba, Saskatchewan and Alberta markets accounted for 4.8 million square feet. Western Canadian consumption at 7.2 million square feet represented more than 1/2 of the particle board used in floor underlay in Canada.

Millwork in the residential housing industry is a large consumer of particle board. Included under this heading are end uses such as door core, material shelving, built in cupboards and counters and interior trim. Most of the particle board used in millwork is painted or overlaid with vinyl, plastic or wood veneer. Nearly three times as much particle board is used in millwork and trim as is used for underlayment.

Contractors supplying millwork items for public and institutional construction have not yet switched over to the use of particle board to any great extent. The primary reason given for this is the lack of structural qualities in particle board which are required in millwork which is constantly subjected to public abuse. The attitude encountered in talking to general millwork manufacturers was that they would likely have to switch over to using particle board within the next few years because of the rising cost of plywood. However they did not intend to use particle board until they had to.

The following Tables 10 and 11 are based on information gathered by the Forest Economics Research Institute, Canadian Forestry Service, Department of Fisheries and Forestry for a study prepared on the use of wood products in the residential housing industry. They compare the use of particle board with the use of competitive panel products for millwork and trim in

TABLE 9

PARTICLE BOARD USED FOR UNDERLAY IN NEW
RESIDENTIAL DWELLINGS CONSTRUCTED - 1969

	<u>Canada</u>	<u>Prairies</u>	<u>British Columbia</u>
	(Thousand Square Feet)		
Single detached houses	5,052	2,096	927
Row houses	633	315	78
Semi-detached	595	162	89
*All apartment buildings	6,369	2,216	1,316
Total	<u>12,649</u>	<u>4,789</u>	<u>2,410</u>

Notes:

- *1. There is no identifiable incidence of particle board being used as floor underlay in apartment buildings of seven or more stories high.
- *2. It is estimated that underlayment is used in 65% of all apartment dwellings of less than seven stories.
- *3. It is estimated that particle board is used as floor underlay for 10% of the total floor area of all apartment buildings of less than seven stories.

Source: Forest Products Research Institute and Planning and Intelligence Branch

TABLE 10

QUANTITIES OF WOOD PANEL PRODUCTS USED FOR MILLWORK
AND TRIM IN NEW RESIDENTIAL CONSTRUCTION-1969 EXPRESSED
IN THOUSANDS OF SQUARE FEET

	<u>Canada</u>	<u>Manitoba, Saskatchewan and Alberta</u>	<u>British Columbia</u>
<u>Plywood</u>			
-single detached houses	18,034	2,969	2,855
-semi-detached and duplex	2,251	348	252
-row housing	2,185	372	245
TOTAL	22,740	3,689	3,352
<u>Particle Board</u>			
-single detached houses	17,682	3,390	2,910
-semi-detached and duplex	2,043	381	249
-row housing	1,435	384	246
TOTAL	21,160	4,155	3,405
<u>Hardboard</u>			
-single detached houses	20,239	3,617	3,366
-semi-detached and duplex	2,043	381	338
-row housing	2,506	461	336
TOTAL	25,428	4,545	4,040
GRAND TOTAL	69,328	12,389	10,797

Based on: Forest Products Research Institute Study

TABLE 11

THE QUANTITIES OF WOOD PANEL PRODUCTS USED FOR
MILLWORK AND TRIM IN NEW RESIDENTIAL
CONSTRUCTION-1969 EXPRESSED IN PERCENTAGE TERMS

	<u>Canada</u>	<u>Manitoba, Saskatchewan and Alberta</u>	<u>British Columbia</u>
Plywood	33%	30%	31%
Particle Board	30%	34%	32%
Hardboard	37%	36%	37%

Source: Forest Economic Research Institute

single detached houses, row houses and two family dwellings. The figures for the consumption of wood panel products in the construction of apartment buildings are not available. It is likely that the consumption pattern is consistent throughout the industry.

Plywood, hardboard and particle board each accounted for about one third of the wood panel products used for millwork and trim.

The figures for the consumption of wood panel products in the construction of apartment buildings are not available. It is probable that the consumption pattern illustrated in the last table can be applied to construction of residential units in apartment buildings.

In order to make some estimates for the consumption of particle board for the residential housing industry as a whole the quantity of particle board used in millwork and trim in the construction of apartment buildings was estimated for Table 12.

Figures are not available which show the increase in the use of particle board in the residential housing industry from 1969 to present. Tables provided in the appendix showing the number of dwelling starts in the industry from 1961 to 1971 may be used as a growth indicator. Between 1969 and 1971 there was a 5% increase in the number of new residential construction starts. Considering the rising cost of plywood and increasing acceptance of particle board by contractors a conservative estimate of the increased market penetration of particle board into the industry during this period is 10%. A similar growth pattern probably occurred in the market for particle board as underlayment in the residential housing industry. The estimated consumption of particle board for these two end uses is shown in Table 13.

TABLE 12

PARTICLE BOARD USED IN MILLWORK AND TRIM IN THE NEW
RESIDENTIAL CONSTRUCTION INDUSTRY-1969 QUANTITIES
EXPRESSED IN THOUSANDS OF SQUARE FEET

	<u>Canada</u>	<u>Manitoba, Saskatchewan and Alberta</u>	<u>British Columbia</u>
Single detached	18,034	2,969	2,855
Row Housing	1,435	384	246
Two-family dwellings	2,043	381	249
*All apartment buildings**	14,863	4,021	2,943
TOTAL	36,375	7,755	6,293

* Figures not available have been requested from Ottawa .

** It is estimated that the quantity of particle board used in millwork and trim per unit would be about 75% of the quantity used per unit in row housing and that the relative quantities used in each region would be consistent.

Source: Forest Economics Research Institute

TABLE 13

ESTIMATED CONSUMPTION OF PARTICLE BOARD IN
THE RESIDENTIAL CONSTRUCTION INDUSTRY, 1971

	<u>Year</u>	<u>Canada</u>	<u>Manitoba, Saskatchewan and Alberta</u>	<u>British Columbia</u>	<u>Western Canada</u>
Millwork and Trim	1969	26,275	7,755	6,293	14,048
	1971	41,831	8,686	7,048	15,734
Underlay	1969	12,649	4,789	2,410	7,199
	1971	14,546	5,364	2,699	8,063

Source: Planning and Intelligence Branch

The estimated Canadian consumption of particle board in millwork and trim in the new dwellings started in 1971 was 41.8 million square feet. The Western Canadian consumption accounted for over 1/3 of this consumption with the Prairies using 8.7 million square feet and British Columbia using 7.0 million square feet.

The estimated consumption of particle board for floor underlay in Canada in 1971 was 14.5 million square feet. The respective consumption in the Prairies and British Columbia was 5.3 million square feet and 2.7 million square feet.

The growth of the mobile home industry has been very rapid, almost quadrupling between 1966 and 1970. A conservative rate of 25% has been used to estimate 1971 production.

More mobile homes are produced in Alberta than in any other province in Canada. Most of the particle board used in this industry appears to be imported. An acceptable product introduced through the mobile home industry might possibly open up a market for particle board in the prefabricated building industry. Tables 14 and 15 portray the development of this industry.

These figures for the prefab building industry in Table 16 include the estimated 3,000 industrial housing units produced in Alberta in 1970. The estimated total Canadian production of prefabricated housing units is 4,900.

If the average size mobile home unit is taken to be 12' x 60' the potential market for particle board is 720 square feet per unit. About 55 square feet can be used for cabinets, counter tops and other interior millwork. Table 17 gives some estimates for this market.

TABLE 14

MANUFACTURE OF MOBILE HOMES -
CANADA AND ALBERTA 1966-1970

	<u>#Units Produced</u> <u>in Canada</u>	<u>#Units Produced</u> <u>in Alberta</u>
1966	3,215	1,487
1967	4,257	2,313
1968	6,302	2,716
1969	9,151	2,984
1970	12,000	4,500
**1971	15,000	5,625

** Estimated growth rate of 25%

Source: Alberta Bureau of Statistics and
Statistics Canada

TABLE 15

MANUFACTURE OF MOBILE HOMES IN CANADA 1970

	<u>#Units</u>
Atlantic Provinces	300
Quebec	1,400
Ontario	4,000
Manitoba	1,000
Saskatchewan	300
Alberta	4,500
British Columbia	500
CANADA	12,000

Source: Alberta Bureau of Statistics

TABLE 16

MANUFACTURE OF PREFABRICATED BUILDINGS AND
MOBILE HOMES IN ALBERTA IN 1970

	<u># of Firms</u>	<u>Value of Shipments</u>
Prefab Building Industry	12	\$34.4 million
Mobile Home Industry	11	\$26.3 million

Source: Alberta Bureau of Statistics

TABLE 17

ESTIMATED MARKET FOR PARTICLE BOARD IN THE
MANUFACTURE OF MOBILE HOMES IN
WESTERN CANADA-1971

	<u>#Units</u>	<u>Quantity in Thousands of Square Feet</u>
Manitoba and Saskatchewan	1,275	989
Alberta	5,975	4,744
British Columbia	625	485
Western Canada Total	7,875	6,251
CANADA TOTAL	15,000	11,740

Source: Alberta Bureau of Statistics and
Planning and Intelligence Branch

The Western Canadian market for particle board in the mobile home industry represents over half of the Canadian market. Over 2/3 of the market in Western Canada is located in Alberta.

A certain portion of the particle board reported as consumed in the furniture industry is also accounted for in the figures on new residential housing.

It is estimated that the particle board consumed in 20% of the output from the household furniture industry and 50% of the output from millwork plants is accounted for in statistics already reported for the new residential housing industry.

The quantity used in New Residential Construction is excluded from Table 18 above. Table 19 summarizes the quantity of particle board used in the furniture industry alone.

The Western Canadian share of the furniture industry is about one sixth of the total Canadian production. A summary of the quantities of panel products consumed in the furniture industry prepared using figures from Statistics Canada is included in the appendix.

The main market for particle board in Western Canada seems to be in those industries associated with the residential housing industry which require wood products as a basic material input. Major end uses are for kitchen cabinets, household furniture, interior millwork (such as built in shelving), counter tops etc. and for floor underlay.

Particle board is not yet being used to a very great extent in construction of, or for furnishings in public and institutional buildings. One significant exception is the use of vinyl or plastic covered particle board in desk tops and small office furniture.

TABLE 18

ESTIMATED QUANTITY OF PARTICLE BOARD USED IN
THE FURNITURE AND MILLWORK INDUSTRY-1969

	<u>Canada</u>	<u>Manitoba and Saskatchewan</u>	<u>Alberta</u>	<u>British Columbia</u>	<u>Western Canada</u>
	(Thousand Square Feet)				
Sash and Door (50% Total)	5,454	255	978	949	2,182
Office Furniture	6,286	101	320	320	741
Special Purpose	7,137	341	287	492	1,020
Household Furni- ture (80% of Total)	21,552	1,152	408	1,160	2,720
TOTAL	40,429	1,849	1,993	2,921	6,663

Estimates are based on cost of materials and supplies and number of plants
times Statistics Canada figures for Canadian production.

TABLE 19

ESTIMATED QUANTITY OF PARTICLE BOARD USED IN THE FURNITURE
INDUSTRY IN 1971, QUANTITY IN THOUSANDS OF SQUARE FEET

	<u>Canada</u>	Manitoba and <u>Saskatchewan</u>	<u>Alberta</u>	<u>British Columbia</u>	<u>Western Canada</u>
TOTAL	44,471	2,034	2,192	3,213	7,439

Estimates are based on 1969 figures plus 10%.

Source: Planning and Intelligence Branch

Too little information was obtained to warrant any reliable estimates of the market penetration of particle board in the industries contacted. It may be useful however to venture some tentative impressions pending a more in depth analysis of the market.

There appears to be considerable variation in the amount of particle board used in the manufacture of cabinets depending on the individual firm. The reputation of some firms producing cabinets is dependent on the type of wood used in their cabinets. Although it is not used in their number one line these firms are beginning to use particle board for backing and ends in their second line cabinets.

The cabinet making industry is made up of a large number of small independent firms. While a higher proportion of particle board is being used in manufacture of kitchen cabinets within the cabinet industry as a whole particle board accounted for from 30% to 95% of the raw material used. The industry is generally enthusiastic about the future of particle board. Two of the firms interviewed projected that within five years 90% of the kitchen cabinets produced by the industry will be made of particle board. The common specifications required by the industry were 5/8" and 1/2" thicknesses in 4' x 8' sheets. A number of firms indicated preference for a board painted on one side. Of the two samples of board supplied by a potential producer, sample 2 which is a three layer board (the two outside layers more dense and hard than the core) appeared to be the most popular. However cabinet makers would not be willing to pay a premium for this board over the number one sample which is a medium density, homogenous single layer particle board very similar to the board currently being used by the industry. Most firms contacted did their own laminating. It was felt that the number of different

laminates which could be offered by the manufacturer would limit the choice range of cabinets that could be produced." Cut-to-size in 12" and 24" widths could be marketed but the firms contacted did not appear too enthusiastic about cut-to-size.

Poor screw holding capacity appeared to be the main drawback to using particle board in cabinets. Other bad features mentioned included the tendency to split or delaminate when subjected to extremes of heat, cold or excess moisture, doesn't adopt itself to remaking, cannot use a dado joint without severely weakening the board, requires extra support if used for shelving, brittle and difficult to handle, heavy, absorbs too much moisture making it more difficult to finish and in some cases it is difficult to obtain a supply of homogenous density board. Good features about particle board mentioned included stability, grain doesn't telegraph and good machinability. As particle board becomes accepted new techniques will be developed to make efficient use of it. At this time price seems to be the major factor behind its use in the cabinet industry.

A related industry to cabinet making which is a heavy end user of particle board is the counter top and desk top manufacturing industry. About 80% to 100% of the wood products used for core material in the firms contacted was particle board. Another end use which required a board with similar characteristics is use for door core material. Specifications required for these end uses were thicknesses from 3/4" to 1 1/2", cut to size up to 18' long and 4' wide. As in cabinet making the density most commonly used was 41-45#. One manufacturer is presently using an imported 54# board for manufacture of desk tops. Difficulties encountered in using particle board for counter tops, desk tops and door core were similar to those expressed in the

cabinet industry. In addition some brands of particle board are more difficult than others to glue a vinyl plastic overlay onto. The lack of screw holding capacity was made up for by the non-warping characteristics of particle board.

A number of household furniture manufacturing firms which produced beds, bedroom suites, living room furniture including upholstered furniture, childrens play furniture and other non-cabinet type furniture were contacted. Only limited use of particle board as a raw material was being made. Particle board has only recently been introduced into these industries. Most of the firms contacted were optimistic about the future use of particle board in their industry. Resistance to the use of particle board will give way once new techniques are developed using it. Price competition was the main reason given for the anticipated change over to use of more particle board.

Response of the manufacturers of store fixtures, and furniture for use in public buildings and institutional settings to the use of particle board was the most negative. Most firms contacted had used particle board on an experimental basis. In addition to the undesirable characteristics pointed out by the cabinet makers particle board cannot stand up to the abuse furniture is subjected to in public buildings and institutions. The combinations of abuse and poor screw holding capacity was illustrated very clearly by one manufacturer of bar tables who had to replace a number of particle board tables with tables made of plywood. The future for particle board in this general millwork is not too promising. From 10% to 25% of the wood panel materials used by the firms contacted was particle board. The requirements were similar to those of the cabinet industry.

The floor underlay represents probably the greatest potential for market expansion in the use of particle board. It is also probably the least

stable. Due to high labour cost in using particle board for underlay may have to be absorbed in the price of particle board if it is to compete. A new product 3/4" tongue and groove type particle board now being introduced in the United States may affect the particle board market. Most contractors have used particle board at least experimentally for underlay. Only a few contractors appear to use it consistently. Firms contacted in the industry estimate between 10%-30% of the underlay used is particle board. Firms not using particle board claim it is difficult to work with, too heavy, brittle resulting in considerable wastage, is difficult to staple, has a high coefficient of expansion and poor glueing properties. Desirable characteristics include smooth surface, no-telegraphing of grain, can be laid in any direction and greater impact resistance. The common specification for floor underlay is 3/8". Oversize, undersize and longer sheets are required in the mobile home industry for underlay. The market penetration of particle board into the mobile home industry for use as underlay is very high. The insulating quality of particle board makes it particularly attractive to the industry.

The do-it-yourself industry represents a small market for particle board. Price more than quality appears to be the criteria for market penetration in the wood panel products purchased for home use.

The demand for special characteristics could not be determined by this initial review of the market. A physical survey of end users will have to be carried out to obtain any reliable data. In general the cabinet makers appeared to be quite satisfied with 4' x 8' sheets. A product, factory painted on one side would help to penetrate this market. Two brands available on the market, duraflake and K₃, can be purchased with one or two sides painted.

The mobile home industry and desk top manufacturers require cut-to-size.

Both particle board and duraflake are supplied to the industry in cut-to-size.

Duraflake appeals very much to the counter top manufacturers because it comes in 18' lengths. A number of firms in all sectors of the industry complained that particle board was not available in 9' and 10' lengths and 5' widths. One of the difficulties experienced now in ordering long sheets is the fact that shorts produced by cutting a double length sheet have to be purchased as well. One company in Canada is now producing a fire resistant board. Little interest in this type of board was expressed by the firms contacted.

Vinyl or plastic laminated board doesn't appear to have a great potential. Most producers are doing their own laminating. One manufacturer in Calgary, Vinyl International is supplying particle board overlaid with plastic or vinyl to the market.

APPENDIX

APPENDIX

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In 1969 an average of 310 square feet (5/8" equivalent) of particleboard was used in single-detached dwellings. Regionally, the largest quantity consumed per unit was in the Prairie Region where the average was 426 square feet. About half this quantity or 216 square feet was utilized per unit in the Atlantic Region which represented the smallest average use of any of the regions.

In 1969 most of the particleboard utilized for single-detached houses was for millwork and trim, mainly as core material in counter tops, doors and cabinet fixtures. The average quantity put in place for this end-use amounted to 226 square feet per dwelling or 73 per cent of the total consumed per unit. The average use of 226 square feet per unit for millwork and trim was quite typical of quantity utilized per unit in all regions.

Most of the remaining particleboard used per unit went into underlayment. The average quantity consumed per unit for this end-use was 64 square feet of 21 per cent of the total put in place per unit. The use of particleboard for underlayment varied considerably among regions, ranging from 149 square feet per house in the Prairie Region to 14 square feet per unit in the Atlantic Region and in Ontario. Particleboard was utilized in 10 per cent of all finished floor areas. Regional variations ranged from 24 per cent and 21 per cent in the Prairie Region and Quebec, respectively, to 2 per cent in Ontario and the Atlantic Region. In 45 per cent of finished floor areas the laying of specific kinds of sub-flooring such as tongue-and-groove plywood made it unnecessary, in conformance with building regulations, to install underlayment.

Smaller quantities of particleboard were used for sheathing roofs and walls of houses and attached garages. On average the quantity used per unit amounted to 13 square feet or 4 per cent of the total utilized per unit.

The remaining seven square feet of particleboard used per unit (2 per cent of total), consisted of nominal amounts utilized for sub-flooring, siding and "other" uses.

Source: Special paper prepared by James G. Bowland-Forest Economics Research Institute
Canadian Forestry Service, Dept. of Fisheries and Forestry.

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AVERAGE QUANTITY OF PARTICLEBOARD USED PER UNIT^{1/}
IN SINGLE-DETACHED DWELLINGS, BY MAJOR END-USE,
AND REGION, CANADA, 1969

(square feet -- 5/8" thickness equivalent)

Major end-use	Canada	Atlantic	Quebec	Ontario	Prairies	British Columbia
Sheathing						
Roofs	6	8	9	1	18	-
Walls	6	6	18	1	14	-
Attached garages and carports	1	-	1	-	1	-
Other items	-	-	-	-	-	-
Average, sheathing	13	14	28	2	33	-
Sundry end-uses						
Sub-flooring	3	7	7	3	1	-
Underlayment	64	14	118	14	149	71
Siding	1	3	2	2	-	-
Millwork and trim	226	176	208	240	241	223
Other uses	3	2	3	3	2	3
Average, sundry uses	297	202	338	262	393	297
Average, all end-uses	310	216	366	264	426	297

^{1/} Includes allowance for waste at on-site locations.

PERCENTAGE OF WOOD AND WOOD-BASED BUILDINGS MATERIALS
IN MAJOR COMPONENTS OF SINGLE-DETACHED DWELLINGS,
BY REGION, CANADA, 1969

Source: Forest Economics Research Institute

Components and Materials	Canada	Atlantic	Quebec	Ontario	Prairies	British Columbia
Flooring						
Sub-flooring						
Plywood	60	49	59	62	46	80
Lumber	40	50	40	38	54	20
Particleboard	*	1	1	-	-	-
Underlayment						
Plywood	42	54	38	37	42	53
Particleboard	10	2	21	2	24	13
Hardboard	3	3	1	1	2	7
None	45	41	40	60	32	27
Finish flooring						
Hardwood strip	28	31	23	40	20	10
Hardwood parquet	11	2	11	19	4	3
Non-wood	61	67	66	41	76	87
Sheathing						
Roof						
Plywood	83	28	77	94	93	84
Lumber	16	71	22	6	5	16
Particleboard	1	1	1	-	2	-
Wall						
Insulation board	46	24	75	62	30	8
Plywood	32	9	12	12	65	79
Lumber	7	54	3	-	1	9
Particleboard	1	1	3	-	2	-
Non-wood	13	9	6	25	2	2
None	1	3	1	1	-	2
Wall cladding						
Lumber siding	19	34	12	9	27	34
Hardboard	5	22	8	4	1	*
Wood shingles	2	10	2	1	1	2
Plywood	2	2	1	1	2	8
Particleboard	-	*	*	-	-	-
Face brick	31	8	39	54	5	1
Stucco	20	3	5	3	59	49
Metal siding	17	19	29	23	4	5
Stone	2	*	3	2	1	*
Precast concrete	1	*	1	*	-	-
Asbestos	1	1	-	3	*	-
Roofing						
Asphalt shingles	96	99	93	99	95	88
Wood shingles	1	*	1	*	*	3
Other	3	*	6	*	4	9

1/ Percentages refer to area. Percentages between $\frac{1}{4}$ and $\frac{1}{2}$ are indicated by an asterick(*). Percentages of less than $\frac{1}{4}$ are indicated by a dash (-).

PANEL PRODUCTS CONSUMED IN THE FURNITURE INDUSTRY

A. PARTICLEBOARD (Volume - '000 sq. ft., 5/8")

A.	B.	C.	D.	E.	F.	G.
Year	Household Furniture (Cat.#35-211)	Office Furniture (Cat.#35-212)	Special Purpose Furniture (Cat.#35-213)	Total Furniture (Cat.#35-205)	Millwork Plants (Cat.#35-205)	Total Furniture & Millwork
1963	7,743	414	1,614	9,771	3,843	13,614
1964	10,188	1,796	1,729	13,713	3,901	17,614
1965	14,004	2,594	2,620	19,218	7,565	26,783
1966	22,431	3,047	4,373	29,851	7,726	37,577
1967	21,620	3,466	7,039	32,125	7,230	39,355
1968	25,057	3,914	6,461	35,432	9,085	44,517
1969	26,944	6,286	7,137	40,367	10,908	51,275

B. PLYWOOD OF PARTICLEBOARD CORE (Volume - '000 sq. ft., surface measure)

1963	10,560	731	3,419	14,710	---	---
1964	14,382	898	4,039	19,319	---	---
1965	4,189	613	1,113	5,915	---	---
1966	4,689	349	1,468	6,506	---	---
1967	5,060	768	1,538	7,366	---	---
1968	5,735	548	1,600	7,985	---	---
1969	5,996	586	1,484	8,066	---	---

C. PLYWOOD (of which a portion could be particleboard core)

(Volume - '000 sq. ft. surface measure; softwood on 3/8" basis, hardwood on 1/2" basis)

1963	30,068	1,801	10,943	42,812	101,022	143,834
1964	31,915	1,933	12,730	46,578	129,563	176,141
1965	42,736	2,105	16,827	61,668	125,195	186,863
1966	47,857	3,344	18,314	69,515	162,484	231,999
1967	<u>37,627</u>	3,629				
1968		4,960			169,151	
1969	44,533	7,448			173,521	

Source: Dominion Bureau of Statistics, from

Cat.#35-205 (sash, door millwork plants)

Cat.#35-211 (household furniture of wood, metal or upholstered)

Cat.#35-212 (office furniture of wood or metal)

Cat.#35-213 (special purpose furniture for hospitals, hotels, churches, restaurants, etc.)

DWELLING STARTS IN CANADA, 1961-1971

<u>YEAR</u>	<u>SINGLE DETACHED</u>	<u>TWO FAMILY</u>	<u>ROW</u>	<u>SUB TOTAL</u>	<u>APT. & OTHER</u>	<u>TOTAL</u>
1961	76,430	11,650	1,864	89,944	35,633	125,577
1962	74,443	10,975	3,742	89,160	40,935	130,095
1963	77,158	7,891	3,895	88,944	59,680	148,624
1964	77,079	8,706	4,755	90,540	75,118	165,658
1965	75,441	7,924	5,306	88,671	77,894	166,565
1966	70,642	7,281	5,000	82,923	51,551	134,474
1967	72,534	9,939	7,392	89,865	74,258	164,123
1968	75,339	10,114	8,042	93,495	103,383	196,878
1969	78,404	10,373	10,721	99,498	110,917	210,415
1970	70,749	10,826	17,055	98,630	91,898	190,528
1971	98,056	13,751	15,659	127,466	106,187	233,653

Source: Dominion Bureau of Statistics Catalogue No. 64-002.

DWELLING STARTS - BRITISH COLUMBIA - 1961-1970
(Units)

Year	Single Detached	Two Family	Row	Sub Total	Apt. & Other	Total
1961	7,799	240	195	8,234	2,936	11,170
1962	8,399	280	363	9,042	4,850	13,892
1963	9,533	374	200	10,107	7,222	17,329
1964	9,388	563	227	10,178	11,487	21,665
1965	9,830	689	740	11,259	10,139	21,398
1966	9,664	537	175	10,376	7,377	17,753
1967	13,201	826	689	14,716	9,384	24,100
1968	12,487	1,126	562	14,175	12,020	26,195
1969	13,035*	1,376	1,325	15,736	16,084	31,820
1970	13,691	1,169	1,566	16,426	10,890	27,316
1971	17,707	1,220	1,803	20,730	14,035	34,765

Source: Dominion Bureau of Statistics Catalogue No. 64-002.

DWELLING STARTS - MANITOBA - 1961-1970
(Units)

Year	Single Detached	Two Family	Row	Sub Total	Apt. & Other	Total
1961	3,759	256	51	4,066	1,612	5,678
1962	3,279	174	345	3,798	891	4,689
1963	3,794	182	264	4,240	2,148	6,388
1964	4,270	230	412	4,912	1,740	6,652
1965	3,621	232	162	4,015	1,954	5,969
1966	3,200	196	129	3,525	1,727	5,252
1967	3,374	216	367	3,959	1,880	5,837
1968	2,649	237	274	3,160	3,296	6,456
1969	3,315	416	707	4,438	7,406	11,844
1970	3,068	889	935	4,892	4,053	8,945
1971	3,719	884	823	5,426	5,279	10,705

DWELLING STARTS - SASKATCHEWAN - 1961-1970
(Units)

Year	Single Detached	Two Family	Row	Sub Total	Apt. & Other	Total
1961	4,625	110	28	4,763	330	5,093
1962	4,448	140	20	4,608	677	5,285
1963	4,984	105	92	5,181	1,100	6,281
1964	4,647	282	192	5,121	2,009	7,130
1965	5,216	351	59	5,626	1,849	7,475
1966	4,497	300	25	4,822	985	5,807
1967	4,289	719	20	5,028	2,265	7,293
1968	3,772	703	8	4,483	2,242	6,725
1969	2,862	442	80	3,384	2,066	5,450
1970	1,552	63	12	1,627	116	1,743
1971	2,932	111	100	3,143	417	3,560

DWELLING STARTS - ALBERTA - 1961-1970
(Units)

Year	Single Detached	Two Family	Row	Sub Total	Apt. & Other	Total
1961	9,197	458	392	10,047	2,707	12,754
1962	9,449	714	559	10,722	3,606	14,328
1963	8,179	461	235	8,875	3,441	12,316
1964	7,819	340	100	8,259	3,754	12,013
1965	7,676	462	92	8,230	3,345	11,575
1966	6,286	462	-	6,748	2,632	9,380
1967	6,437	641	435	7,513	5,161	12,674
1968	7,415	861	645	8,921	10,690	19,611
1969	7,881	974	1,308	10,163	12,499	22,662
1970	6,575	897	2,422	9,894	6,357	16,251
1971	3,250	1,007	3,153	14,316	11,276	25,602

PARTICLEBOARD TARIFFS

		JAN. 1st.		
<u>A. UNITED STATES</u>		<u>1970</u>	<u>1971</u>	<u>1972</u>
245.45	00	Wood particleboard, whether or not face finished: if 90% or more by weight of the wood components consist of one, or any combination, of the following hardwoods: <u>Literocarpus</u> spp., <u>Triplaris</u> spp., or <u>Virola</u> spp. Sq.ft.		
		8%	7%	6%
245.50	00	* Other Sq.ft.	14%	12%
				10%

B. BRITAIN

44.18	Reconstituted wood, being wood shavings, wood chips, sawdust, wood flour or other lignous waste agglomerated with natural or artificial resins or other organic binding substance, in sheets, blocks or the like:		
	(a) Flaxboard	10%	
	C'wealth & E.F.T.A.	Free	
	* (b) Other: (wood chipboard, etc.).....	18%	
	C'wealth & E.F.T.A.	Free	

C. EUROPEAN COMMON MARKET

44.18	* Reconstituted wood being wood shavings, wood chips, sawdust, wood flour, or other lignous waste agglomerated with natural or artificial resins or other organic finding substances in sheets, blocks or the like .	12.4%	12.2%	12.0%
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(E.C.M. Countries include Belgium, France, Germany, Italy, Luxembourg, Netherlands -- between these countries there is no particleboard tariff).

D. CANADA

50600-1	Manufactures of wood, n.o.p.		
	British Preferential Tariff	15%	15%
	Most Favoured Nation Tariff	17%	16%
	General Tariff	25%	25%

		JAN. 1st.		
		<u>1970</u>	<u>1971</u>	<u>1972</u>
. <u>Canada</u> -- Cont'd.....				
0645-1	Particleboard made of ground wood particles and phenolic type synthetic resin, weighing not less than 70 lbs. per cubic foot, for use in the manufacture of moulded laminated sheet impregnated with synthetic resin			
	British Preferential Tariff	10%		
	Most Favoured Nation Tariff	15%		
	General Tariff	30%		
3901-81	Plates, sheets, film, sheeting, strip; lay-flat or other tubing, blocks, bars, rods, sticks, non-textile monofilament and other profile shapes imported in lengths, all produced in uniform cross-section (includes plastic overlaid particleboard, i.e. vinyls, melamines, pvc, etc.)			
	British Preferential Tariff	17½%		
	Most Favoured Nation Tariff	17½%		
	General Tariff	25 %		

ote: 50600-1 includes all particleboards
 50645-1 includes specialty, high-density boards -- this special tariff will be dropped June, 1970
 93901-81 includes plastic overlaid particleboards

-- Tariffs applying to standard Canadian particleboard

★ Decking Performance Guarantee ★

Duraflake Decking is guaranteed to be free of defect in material and workmanship. It meets or exceeds Commercial Standard CS236-66 specifications for Type I, Density B, Class 2 particleboard.

DURAFLAKE Decking is guaranteed by the Duraflake Company to meet or exceed the above minimum specifications. To insure that these specifications are met, all Duraflake products are subjected to rigid quality control and continuous daily in-plant inspection by TECO, (Timber Engineering Co. of Washington, D.C.). If any Duraflake Decking panel fails to meet the specifications specifically mentioned in this guarantee and results in a floor failure, Duraflake Company will, at its option:

1. Refund the purchase price plus the cost of the original installation of the defective panel and its floor covering, or
2. Repair or replace, without charge, the defective panel plus the adhesive and floor covering.

This guarantee is applicable only if (a) the Decking is applied according to instructions and (b) Duraflake Company is given written notice of claim within one year from date of installation and is given the opportunity for 30 days after such notice to inspect the floor prior to any alteration, change or repair thereof.

THIS GUARANTEE IS NULL AND VOID UNLESS DURAFLAKE DECKING IS APPLIED ACCORDING TO INSTRUCTIONS.

DURAFLAKE DECKING STANDARDS

- Provides uniform, superior smooth surface—no voids or soft spots. Good mastic adhesion.
- Thickness variation will not exceed ten thousandths of an inch, plus or minus.
- Dimensionally stable.
- Maximum squareness variation will not exceed $\frac{1}{8}$ " per panel.
- Maximum straightness variation will not exceed $\frac{1}{16}$ " per panel.
- Will not contribute to tile cracking when handled and installed according to manufacturer's instructions.

CERTIFIED SPECIFICATIONS

Density (lbs./cu. ft.) as shipped.....	46±
Modulus of Rupture.....	2800 psi
Modulus of Elasticity.....	450,000 psi
Surface Hardness (Janka Ball Test).....	1000±
Internal Bond.....	110 psi
Water Absorption—24 Hr.....	10%
Thickness Swell—24 Hr.....	5%
Linear Expansion.....	0.28%
Face Screw Holding (lbs.).....	300 lbs.
[ASTM Falling Ball Impact Test.....]	40" min.

Installation Instructions

HANDLING:

Store and handle Duraflake Decking in the same manner as any finish wood material. Keep Duraflake Decking perfectly flat on bunks in a dry, covered area.

JOIST SYSTEM:

Joists must be of steel and of a size and distribution so as to be 2' x 4" or greater timber, kiln or air dried to 18% maximum moisture content, bucking in spacing between joists shall not exceed 16" on center. Insulate entire floor with maximum 1" thick fiberglass insulation. The tops of all heat ducts must be covered with additional fiberglass insulation 1" thick to prevent thermal drying of floor components.

APPLICATION:

If the joists run the length of the coach, $\frac{5}{8}$ " or thicker Duraflake strips 8" or wider, or $\frac{5}{8}$ " or thicker plywood cross pieces, 4" wide, must be nailed securely and flush into the joist system on 48" centers to support the joints between Duraflake panels. The surface grain direction of the plywood cross pieces must be parallel to their length. If the joists run the width of the coach, no cross pieces are necessary.

Duraflake Decking panels must be laid across the width of the coach, and glued with polyvinyl acetate adhesive or equal where they come in contact with the joists and the cross pieces if present. Allow for moderate contact. DO NOT FORCE PANELS UP TIGHT. It is recommended to use the panels of sufficient length to cover the full width of the mobile home, if panels shorter than the coach width are used, their joints must be edge blocked or supported as above.

FASTENING:

Each panel must be glue/fastened with $1\frac{1}{2}$ inch screws or $1\frac{1}{2}$ inch ring-grooved nails 4 to 6 inches o.c., around the edge of the panel and 8 to 10 inches o.c. on the joist line throughout the body of the panel. Panels may also be stapled 4 inches o.c. around the edge and 4 to 6 inches o.c. on the joist lines throughout the body of the panel. Staples must have divergent points, $1\frac{3}{4}$ " minimum leg length, and $\frac{7}{16}$ " minimum crown width. Drive fasteners perpendicular to the surface and no closer than $\frac{3}{8}$ " to the panel edge.

FLOOR MAINTENANCE:

Use damp mop technique in cleaning, and use only floor covering manufacturer's recommended cleaners. Do not flood the floor with water. Protect the floor surface with a recommended wax or coating.

FINISH FLOOR APPLICATIONS:

Fill open or gouged areas with a hard quick-setting patching compound. Sand all rough or uneven areas and remove all foreign material. Use a good quality adhesive as recommended by floor covering manufacturer for the type of floor covering being used. Apply adhesive with a trowel using sufficient spread to obtain a minimum of 50% adhesive transfer to the floor covering. Floor coverings less than $\frac{7}{16}$ " in thickness are not recommended.

7 IMPORTANT FACTS ABOUT DURAFLAKE DECKING

- Duraflake Decking is a precision engineered, wood-formed board, that meets rigid tests for smoothness, strength, machinability.
- Duraflake Decking is a dimensionally stable board of balanced construction
- Douglas fir and Western hemlock flakes form Duraflake Decking's tight inner core while finer particles provide a smooth, even-textured, durable surface.
- Duraflake Decking is grain-free and has no patches or core voids.
- Screws used on surfaces or edges bite into real wood, hold fast.
- Duraflake Decking is very resistant to moisture.
- Duraflake Decking is very resistant to indentations.



TECO TESTED



Duraflake Company

Division of Willamette Industries, Inc.
P.O. Box 428, Albany, Oregon 97321

This TECO-tested label appears on every Duraflake Decking panel and is your assurance of guaranteed performance.



Over 11 years of research and development has kept Rexwood Flakeboard in the forefront as Canada's Best Particleboard.

Each stage in manufacturing is carefully engineered and guarded for close quality control by experienced operators.

Carefully selected flakes from choice logs give Rexwood boards the high dimensional stability which resists warping or twisting and the tough strength for exceptionally high screw holding ability.

Expensive equipment ensures correct formation of the board for day in, day out, consistent high quality. No matter how you cut, fasten or laminate it, Rexwood works beautifully as a corestock. The edges readily machine to tight clean cuts that remain strong and dent resistant for good bonding.

With a super sanding job on the fine dense surfaces Rexwood is ideally suited for vinyl or thin wood veneer overlays, and for painting or printing.

As well as its wide application in all types of furniture for the home or office, Rexwood's acoustical qualities have proven ideal for T.V., stereo and radio cabinets. Its hard smooth surface is required in pool tables and for various games. The mobile home and trailer industry find it superior for their rugged demands. Rexwood is found in ships and trains, homes and hospitals, libraries and every type of building. Let us help you engineer cost saving applications of Rexwood in your manufacturing operation.

BUY REXWOOD — QUALITY DOESN'T COST — IT PAYS!

Our Specialty Items

- **CUT TO SIZE**

Fast, accurate service. All sizes.

- **SHELVING**

One edge filled, sealed and sanded.

- **HIGH DENSITY BOARD**

From 52 to 60 lb. density ($\frac{3}{4}$ to $\frac{3}{16}$ ")

- **FIRE RETARDANT BOARD**

in 4' x 16' sheets

- **WATER RESISTANT BOARD**

Phenolic Bond

REXWOOD FLAKEBOARD is manufactured to exceed the requirements of Canadian Standards Association Specifications 0188 - 1968 for the highest quality furniture corestock. It is therefore a superior board for all other interior applications such as counter-tops, underlayment, wall panelling, shelving, cupboards, etc.

REXWOOD SPECIFICATIONS Average as follows:

Thickness Tolerance	 + .003
Length & Width Tolerance	 + 1/16
Density	 41 lb./cu. ft.
Modulus of Rupture	 3,200 (p.s.i.)
Modulus of Elasticity	 500,000 (p.s.i.)
Internal Bond	 73 (p.s.i.)
Hardness	 600
Moisture Content	 6% to 8%
Screw Holding. (# 10 Screw) (Surface)	 350 lbs.
" " " (Edge)	 300 lbs.

Panel sizes are up to 61" x 121" and up to 49" x 194".
Panel Thicknesses from $\frac{3}{16}$ " to 1-1/4" (by 1/16th)

WRITE OR PHONE FOR SAMPLES AND INFORMATION TO:

REXWOOD PRODUCTS LIMITED

Box 1840

New Liskeard, Ontario

Phone 705-647-6775

PARTABOARD

"The New Wood"
stronger smoother whiter



Discover the cost-cutting man-made wood.
The wood with nature's oversights corrected.
No warps or splits. No bark. No knots.
No splinters.
No grain or grain direction waste.

The complete range of thicknesses available

1/4" 3/8" 1/2" 7/16" 5/8" 11/16"

3/4" 7/8" 1" 1-1/8" 1-1/4"

PARTABOARD meets or exceeds "Property Requirements
for Industrial Board" as published in C.S.A. Standard 0188.



description

PARTABOARD is the new man-made wood. It resists warping and there are no splinter, bark, or knot problems like those you find in plywood and lumber. And there are no patches or knot holes. Because there's no grain, there's never any grain direction wastage. And PARTABOARD is completely tested and passed on *both sides*.



actual size
3/4" board.



This makes PARTABOARD the perfect panel for kitchen cabinets, stereo and TV cabinets, cupboard shelves and doors, counter tops, wall panelling, bi-fold and sliding doors, built-ins, valance boards, bookshelves, coffee tables, bedroom furniture, planters, room dividers, and storage cabinets.

The unique PARTABOARD process builds a true three layer board. Two super fine surfaces and an exceptionally strong solid centre. Both surface layers consist of carefully selected small particles (fines), graduated so the very smallest are at the surface. The centre layer of PARTABOARD contains a homogeneous mixture of both the smallest and largest particles, this gives maximum strength. The result is a smooth surface, tighter edges, stronger panel, perfect for painting and veneering.

PARTABOARD's strength and consistent quality make gluing, fastening, and tricky millwork problems simple.

PARTABOARD is made from selected Fir and Spruce particles combined with resin under pressure and heat.

advantages

When you're overlaying:

Forget about telegraphing problems with PARTABOARD. No matter how thin your veneer or overlay, PARTABOARD can't telegraph. The super fine surface gives you a grain free uniform base without a ripple.

When you're working it:

What's wood got that PARTABOARD hasn't? Chips, cracks, splinters, bark and knots. That's what! Go ahead. Shape. Drill. Rout. Saw. Work in any direction. There's no grain to worry about. The edges stay clean and tight. And the quality of PARTABOARD never changes from one panel to the next.

When you're finishing:

PARTABOARD is about as smooth as you can get. And as perfect. With a surface so flawless, finishing is a snap. Wax? Stain? Varnish? Paint? Certainly. PARTABOARD's ready, finished for the finish.

When you're fastening:

Fastening's a cinch. PARTABOARD's tough, uniform and consistent in quality. Joints are always accurate, secure and permanent. Always follow the gluing, pre-drilling and screwing method and you'll have solid, lasting cabinetry.

When you're gluing:

PARTABOARD's smooth, flawless surface, combined with its adhesion properties as a wood product make it a proper dream for gluing.

uses

You can use PARTABOARD most places you can use wood. You'll see PARTABOARD in kitchen cabinets, stereo-TV cabinets, countertops, built-ins, store display fixtures, flat furniture applications, wall panelling, planters, room dividers, institutional furniture, mobile home interiors, storage cabinets, decor panels, and as a core for almost any plastic laminate or veneer application. It's versatile.



architectural specifications

SHORT FORM:

"... shall be PARTABOARD as produced by Parta Industries Ltd., Grand Forks, B.C."

LONG FORM:

"... shall be PARTABOARD a true 3-layer particleboard with a graduated surface and homogeneous core; manufactured from Canadian Coniferous Species Douglas Fir/Larch and Spruce. Produced by PARTA Industries, Grand Forks, B.C."

physical properties *minimum average*

Values are based on minimum average test results for 3/4" board using procedures outlined by the Canadian Standards Association and published as C.S.A. Standard 0188-1968.

Density	42 lbs. per cu. ft.
Modulus of Rupture (M.O.R.)	3,200 p.s.i.
Modulus of Elasticity (M.O.E.)	500,000 p.s.i.
Internal Bond	85 p.s.i.
Screw Holding — Face	350 lbs.
Edge	300 lbs.
Hardness	500 lbs.
Moisture Content at time of shipment	6 - 9%
Thickness Tolerance	± .003 inches
Length & Width Tolerance	± 1/10 inches
Maximum Panel size	61 x 121 inches

Custom sizes, thickness up to 1-1/4" and higher or lower density board available on quotation.

PARTABOARD meets or exceeds "Property Requirements for Industrial Board" as published in C.S.A. Standard 0188.

PARTABOARD "The New Wood"

MANUFACTURED BY PARTA INDUSTRIES LTD., GRAND FORKS, B.C.

For Product Information, Contact:

Parta Industries Ltd., P.O. Box 3957, Station 'D', Vancouver 9, B.C.
Telephone (604) 732-7605

This will confirm the physical property data on the Evans Mobile Home Decking.

Density(lbs./cu. ft.) minimum	45
Modulus of Rupture(psi)	2800
Modulus of Elasticity(psi)	425,000
Internal Bond(psi)	110
Water Absorbtion 24hr(%)	10
Thickness Swell 24hr(%)	5
Linear Expansion 24hr(%)	.28
Face Screw Holding(lbs)	325
Edge Screw Holding(lbs)	250
Lateral Nail Hold $\frac{1}{2}$ "(lbs)	500
Hardness(lbs)	1000
Moisture Content(%) +1,-2	6

Actually, the physical properties of our board are higher than those shown. These are generally the Best physical properties quaranteed by any competative product. Incidentally there is a U.S. interim (proposed) standard for mobile home decking which is about to be published here by the N.P.A. (National Particleboard Association). The Standard (A.P.A.,1-70) will provide for a full range of physical properties and in effect will be leaving the selection of the grade up to the individual coach manufacturer.

<u>CLASS</u>	<u>M.O.R.</u>	<u>M.O.E.</u>	<u>I.B.</u>	<u>L.E.</u>
D-1	1600	300,000	70	.35
D-2	2400	400,000	80	.30
D-3	2800	450,000	80	.30
Thickness Tolerance	.020			
Squareness Tolerance	1/8" on 10'			

As you can see, the so called "Standard" is no standard at all in that it covers the whole range of physical properties presently being manufactured. Class D-1 is nothing more than a straight underlayment spec. Class D-2 allows most of the boards produced in the South of Southern Pine and Class D-3 is a true industrial quality specifcation although it too appears to have been written to accommodate some of the poorer quality boards produced on the West Coast. (The IB of a true industrial board should be nearer to 100 than to 80)

Canadian

Urea Bonded Particleboard

(Jan. - Dec., 1971)

MMsf 5/8"

a. Installed capacity (Dec. '71) ¹	420.
b. Production ²	204.
c. Imports ³	48.
d. Exports ⁴	10.
e. Stocks at Dec. '70 ⁵	5.7
f. Stocks at Dec. '71 ⁵	7.8
g. Apparent Consumption (b+c+e-d-f)	239.9
h. Operating ratio ⁶	60%
i. Per capita consumption ⁷	11.1 s.f.

- Estimated by Wood Products Branch: a) Forest Industries, July 1971
b) Timber Trades Journal, Sept. 25, 1971.
c) and other sources.
- Estimated from Statistics Canada 36-001 less estimated 1971 production of phenol bonded board.
- 1971 imports of 60 MMsf are estimated to average $\frac{1}{2}$ "
Conversion to 5/8" yields 48 MMsf 5/8".
- Timber Trades Journal March 25, 1971 shows Canadian exports at 9795 metric tons. Conversion to s.f. 5/8" yields 10 MM. All exports are assumed to be urea bonded board.
- Estimated by Statistics Canada to be two weeks production.
- Allowing for start-up of one new mill in June, ie., considering six months capacity only. No reductions allowed for mill closures or intermittent operation.
- 1971 population estimated at 21,711,000.

Primary Wood Products Division
Wood Products Branch,
Department of Industry, Trade
and Commerce.

Table 4

A. CONSUMPTION OF PARTICLEBOARD IN CANADA

1963 to 1969

<u>Year</u>	<u>Population</u>	<u>Per Capita Consumption (Sq.Ft. 5/8" basis)</u>	<u>Total Consumption (Thousand Sq.Ft. 5/8" basis)</u>
1963	18,931	3.1	58,658
1964	19,290	3.9	74,400
1965	19,644	5.1	100,365
1966	20,015	6.2	123,507
1967	20,405	7.1	145,685
1968	20,744	7.6	156,931
1969(e)	21,061	9.5	200,000

B. FORECASTED CONSUMPTION OF PARTICLEBOARD IN CANADA

1969 to 1980

<u>Year</u>	<u>Population⁽¹⁾ Forecast</u>	<u>Forecasted Per Capita Consumption (Sq.Ft. 5/8" basis)</u>		<u>Forecasted Total Consumption (Thousand Sq.Ft. 5/8" basis)</u>	
		<u>(a)</u> At 10% Growth Rate	<u>(b)</u> At 15% & 12% ⁽²⁾ Growth Rate	<u>(a)</u> At 10%	<u>(b)</u> At 15% & 12% ⁽²⁾
1969(e)	21,061	9.5	9.5	200,000	200,000
1970	21,500	10.5	10.9	225,700	234,300
1975	23,764	16.8	22.0	399,240	522,800
1980	26,027	27.1	38.7	705,300	1,007,200

Note:- (1) Source of Population; Economic Council of Canada; Study 19, September 1967; population is forecasted at low, medium and high growth rate; for this forecast the medium level is used.

(2) Per Capita Consumption to increase at a 15% rate until 1975, then fall to 12% up to 1980.

(3) Extruded and exterior boards included.

(e) estimated

